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The Canadian Entomologist

VOL. LIII. GUELPH, OCTOBER, 1921. No. 10

POPULAR AND PRACTICAL ENTOMOLOGY.

THE LIFE HISTORY OF A HOBBY HORSE.

BY FRANCIS J. A. MORRIS,
Peterborough, Ont.

PART III. SECOND CHILDHOOD—THE TREE'S INCLINE.

(Continued from Page 199.)

In spite of considerable study in the Science of Botany, I remained an incorrigible amateur, loving the wild flowers for their beauty, and to a great extent ignoring unsightly or inconspicuous weeds. But wherever a genus or a family of plants had any attractive species among them, it kindled one's eagerness to run to earth as many members of the family as possible.

The very first flower of the season opened up half a hundred avenues rich with surprising discoveries. This was the charming little Hepatica, pride and prime of Ontario's spring—the true Canadian primrose. The flower in itself is beautiful, of a delicate mauve, sometimes almost pure white, sometimes as pure pink or blue, and ranging through all the shades of purple or lilac between these extremes; it is true that during its short blossoming season, the plant can show only last year's leaves, darkened in the weather; but the little communities of blossom are so closely clustered, and their stems so dainty with soft silk, that the absence of foliage is hardly noticed, and before the bloom falls the new young leaves have already pushed up their 3-lobed fans all clothed with silver down; sometimes the blossoms are fragrant; they are always beautiful; like the May Flower or Trailing Arbutus of the Atlantic Provinces, well worthy to be a national emblem; it is common everywhere in the Dominion from the Atlantic to the Pacific, and—surest test of all—a prime favorite with the children. With me it was a clear case of love at first sight; but then I was always just as eager as any child to race to the woods after school and make friends with the Spring flowers.

About half a mile from the town, just east of the Brockville road, was a steep wooded ridge with a southern slope, and beyond it a spacious hardwood bush. It was on my first trip to this place that I received my initiation at the hands of the Science teacher; and evidently the news of this spread, for the pupils greeted me next day with grins broad or shy according to their nature. It was only a small piece of Indian turnip that I was given to chew, and at first—such is the diabolical cunning of the fiend that dwells in the corm—the flavor was soft and cool like a parsnip; I had, in fact, already spat the gobbet out before the burning began; but once the poisoning (for it is nothing less) first showed its symptoms, it grew at deadly pace to an intolerable burning; even next day there were still countless little crimson specks on my tongue. I cannot describe the sensations better than by saying that it brought back vividly to my mind the red horror of a far-off day in the nursery when I purloined from a cupboard half a small salt-spoonful of Cayenne pepper and ate it in

pleased anticipation based on its pretty colour. I must have been very small at the time, for I made my way down the backstairs to the kitchen, clambered onto a chair and so into the sink, where I was found presently by the cook, sitting with my tongue out under the cold tap, trying in vain to put out the fires.

Hepatica was still cropping up everywhere on this slope and among the leaves in the wood, when I discovered my first Bloodroot and Dog Tooth Violets. And here began a new chapter in the romance, for the Bloodroot I found was a "poppy" and the so-called violet or Yellow Adder's Tongue no less than a wild "lily." This path of botanical kinship was full of surprising turns, you never knew what you'd find just round the corner. It had all the comicality of a 3-legged race, with its dot-and-carry-one of incongruous pairs, columbine and kingcup, leek and orange lily, wood-nettle and elm, linking it along together. The day of the dog-tooth violet was also the day of my first real violet, the little white fragrant kind of the swamp; and in a few days I had found three or four species, each in turn more beautiful than its fellows, all with the same sweet wistfulness in the face of them and delicate pencilling of eyelashes. It was while I was still bending over the violets, as it seems to me, that I suddenly noticed the woods were full of fairy troops; they had stolen a march upon me; really the best way to see the fairies is to pretend you're not looking for them; then they peep out from under the leaves and creep from the hollows. They were all round me—"Jack-in-the-pulpit," the "Steeple-chimes" of New York's Governor (Clintonia), Bellwort, Wild Lily-of-the-Valley, Trilliums, Wake-robin, Twist-stalk, Solomon's Seal, Indian Cucumber, Ladies' Slippers, Wild Ginger, Goldthread, Baneberry, Crinkleroot, Dutchman's Breeches, Squirrel Corn, Bishop's Cap, Foamflower, Cranesbill, Milkwort, Shinleaf, Starflower, Lousewort, Twinflower; what magic names and forms to conjure with, and bring the whole rout of Titania's court abroad among the maples! "A wood near Athens," or a sugar bush in old Ontario—what odds to the little folk?

It was from these beginnings that I swung down the great avenues of Flowering Plants; the way of Arrowhead and Arum, of Lily and Orchid; the way of Sweetgale, Sandalwood and Birthwort; the way of Crowfoot, Pink and Poppy, Sundew and Saxifrage, Rose, Jewelweed and Mallow, Enchanter's Nightshade and Bunchberry, all flowers with petals kept apart; and last, the way of the flowers with welded petals; and these, after the Lilies and Orchids, were my favorite flowers; fortunately, their prime was after midsummer, somewhat later than the hey-day of the Polypetalous tribe, so that I could dally awhile with the latter, before I need devote all my time, as sooner or later I must, to the beautiful Heaths, the Primulas and Gentians, Bluebells and Lobelias; but perhaps above all, to the great phalanx from Borage to Bladderwort, headed by the incomparable Figworts; in this family with its Speedwells, Turtleheads, Beardtongue, Monkey Flower, Hedge Hyssop and Gerardias, cousins of the lovely English Foxglove, I was never tired of working; adding species to species, and genus after genus, till every gap was filled.

The countless paths of marvel revealed to me along the way have served to fill a score of summers to the brim with beauty, and still no sign of exhaustion; they have made the addition of Ferns and Club-mosses to the Flowering Plants,

the visits to a new district, the tramps in England and Wales, the trips to Ireland and Scotland, one long revel of delight; and what began it all? A few hours of drudgery with a botanical key and half a mile of common dusty road, trodden casually one April afternoon at the end of a day in school.

After two years in Smith's Falls I accepted a private tutorship in the neighbouring town of Perth, with headquarters at the Rideau Lakes from April to October. My pupil was as ardent a nature lover as I was myself and there grew up between us a close friendship of the give-and-take kind. His paradise was bird land, and if I taught him half as much about flowers in our long summer rambles as I learned about birds, we have both good cause to be grateful.

No one can haunt the countryside for flowers so constantly as I did without storing up quite a fund of mental notes, conscious or unconscious, about their fellows, furred and feathered. Where I had missed at first the Skylark from the meadows, I came to look for the Horned Lark, the Meadow Lark, the Song Sparrow, the Vesper and the Bobolink; if I could no longer hear the Blackbird and the Thrush, I could listen to the Bluebird and the Robin, and train my ear to tell apart the notes of the Catbird and the Oriole; while, in the woods themselves, I learned to trace to their source a score of mysterious notes from Cuckoos, Flycatchers, Thrushes, Vireos and Warblers —the Wetfoot, the Wood Pewee, the Veery, the Oven Bird, the Redeye and the Yellowbird. About the swamps and marshes of the Rideau abounded Grackles and Soldier-birds, Mudhens, Grebes, Bitterns and Herons; sometimes we flushed a Woodcock or caught a rare glimpse of Gallinule, Green Heron or Least Bittern. It was here that I first met the Great Northern Diver, the immortal Loon, and learned to admire its mastery of the watery element. One day, too, on the Lower Rideau, I had a unique experience; I was trolling slowly round a small island within a few yards of its wooded shore when I surprised a loon on its nest; in a flash it scrambled down the bank and made a running dive for the open, actually passing just under the bow of my little skiff; I could see the bird so distinctly as to note the powerful oarage of its great black webs, but what astonished me most was to see that its wings were not closed tight to the sides, but thrust partly forward and out, so that the water streamed away in greenish bubbles over the edge of the pinion; the wings must of course be used like fins to keep the bird on an even keel and plane up or down when submerged in its limpid depths.

Soon after dusk the loon suffers disembodiment and all night long you may hear from some abode of lost souls its wild cries and shouts of maniacal laughter. Sound is the strangest of all our bodily sensations; objects of sight have nothing mysterious about them; there they are before us plain to the view, and easily verified if we choose by touching or handling; but sounds are a thing apart, unsubstantial, the ghosts and wraiths of the ear. Ever since the race was in its infancy men have broken their hearts over an echo, and pined away with infinite yearning; we have peopled the night with all kinds of fabulous beings to be known only by their cries; the cuckoo, the white throat, and even the nightingale owe their charm to being hidden; to see the singer is to touch the magician and his virtue departs. When night or the leafy screen of the forest seals up the eyes, what a dance the imagination is led through that

other channel of sense, the ears! From earliest childhood, the voices of the night minister in each of us to the race's instincts of superstition and awe; the wind whistling in the chimney or rattling at the window, sighing and sobbing like some lost spirit; the weird music of the Whip-poor-Will or the Night Jar, the boding cry of the owl, the demoniac laugh of the loon, have all the power to call up ghoulish forms of primitive animism in our minds, out of the long dormant paganism of our past; come dawn and the sunrise, we chase them away for empty phantasms with a single sweep of the eye.

I remember, one autumn, a boy called in to ask my pupil over to his father's farm; a wild cat had been heard in the neighborhood, and he had better bring his gun. The next hour or two I spent in rapt attention to story after story about wild cats, lynxes and wolverines; their cunning, their daring and ferocity. Late at night the huntsman returned after a fruitless chase; several times he had heard the animal. but always at a distance, and nothing could be seen. Night after night the cries were repeated and gradually the thing grew bolder; till at last its cries were heard quite near our own cottage proceeding from a little orchard; my pupil stole out with the gun, and presently we heard a shot; the wild cat was dead; it was a little grey Screech Owl, one of the most beautiful creatures I have ever seen. Its cry is a long quavering whistle that comes rippling down the scale through several notes, quaintly suggestive of a pony's whinny; like so many of the owl-cries it is curiously deep, full and liquid, as though born of hollow wood and issuing from a vault more spacious than channelled reed-pipe.

About a mile away through field and wood lay a small lake famed afar for its bass. In stormy weather gulls came up the Rideau from the St. Lawrence, and on "Bass" Lake at such times we used to see a very beautiful bird from the coast known locally as the Sea-swallow; much smaller than the common Gulls, very graceful in flight, and with long narrow wings, perhaps the Least Tern.

In the height of the summer as we came home late at the end of a day's fishing, the groves seemed fairly alive with Whip-poor-Wills flogging the night with their strange whip-lash of a cry. It is not nearly so common a sight as its cousin, the Night Hawk, being more shy and seeking the seclusion of the woods both for feeding and nesting. The Night Hawk lays its eggs right in the open; often, in the city, its eggs may be found on the flat roofs, over which it flies hawking all the evening, or even in broad daylight when skies are grey. Both birds, though utterly defenceless, if surprised on their nest, will fly in the face and flutter threateningly just like the partridge. I remember the first time I went to the village of Lanark, in a search for orchids, what crowds of Night Hawks were in sight feeding over the swampy woods. Just outside the village was a high rocky ridge overhanging a great swamp of spruce, cedar and tamarac. After sundown at the end of my day's botany I would take up a position on the top of the slope to watch these birds; there were often two or three score of them in sight at once; they usually hunted in couples, though sometimes a string of five or six would go together (perhaps all of one sex) in zig-zag flight and with sharp cheeping cries; on a calm evening they seemed never to tire of their favorite game of diving; sometimes one of a pair (probably the male) would climb high up and then drop like a plummet past its mate in a

nose dive almost to the ground, when out shot the pinions and the tail seemed to flatten back as the daring aeronaut glided into the horizontal with a booming whirr of air through its feathers. If the game never palls on the bird, it certainly never palls on the human spectator, let him once contrast the clumsy barging movements of his own earth-bound body with the airy grace and swift power of living wings.

The finest spectacle of flight I ever watched was a game of just this kind played by a pair of bald-headed eagles on the Rideau. Here the birds took turns in soaring and diving, one bird floating almost motionless in mid-air while its mate soared in a bold spiral of immense sweep; suddenly from the dizzy top of its staircase the climber stooped, and plunged sheer down throhgh the walls of space, apparently almost grazing the still form of the other in its descent; then with a faint bark or two of enjoyment it would flap and glide its way up into position to sleep outspread in mid-air, the floating target for its fellow's plunge. At first, as I have said, they took turns in this daring sport, and the game seemed to develop fresh variations in the very practice of it; sometimes there was a skirmish in mid-air, one dashing at the other on the level as though lunging out from the shoulder with a full-face blow; this the other would avoid by a sudden side-step or an upward leap; once the bird on guard stood its ground, and at the very instant of the fearful impact, suddenly the pair of them shot up in a double-headed geyser, rising rampant face to face, like game-birds at a cocking main, in the heat of their fierce encounter.

(To be Continued.)

THE NYMPH AND BREEDING PLACE OF AESHNA SITCHENSIS HAGEN (ODONATA).

BY E. M. WALKER,
Biological Dept., Toronto University.

Aeshna sitchensis Hagen, one of the two smallest and most northern species of the genus in North America, has been known since 1861, but though it has been taken in a number of localities since then, from Atlantic to Pacific, almost nothing has been recorded concerning its habits and haunts.

The first time I came upon this species in numbers was on June 29, 1913, at Banff, Alberta (4,500 ft.). They were flying over a partly cleared area on the side of Sulphur Mountain below the Upper Hot Springs, probably not more than 500-600 feet above the town. All were young individuals with the colours not yet quite mature, so that I felt reasonably certain that if I could find their breeding place, the exuviae would be present and perhaps nymphs would be obtainable. Accordingly I searched all the likely looking ponds, lakes and streams I could find in the neighbourhood; but, although Aeshna nymphs and exuviae were found, they all belonged to *A. palmata* and *A. interrupta*.

During succeeding years, although I spent some time in northern localities, where this species is regional, I found no trace of it until the season of 1921. In July of that year I was again collecting in Banff, but spent two weeks there without seeing *Ae. sitchensis* at all. After visiting the Pacific Coast, however, I returned to Banff, spending a day and a half (Aug. 5 and 6) on the way at Field, B.C. (4,072 ft.).

About two miles west of the station, on the north side of the river, I found, at the foot of a mountain, a small mossy bog, fed by springs and by the seepage from a small cold mountain brook. The bog was partly enclosed by spruce forest and supported a scattered growth of stunted white spruce and willows, shrubby cinquefoil, and a few other swamp plants, but, excepting the moss, which was partly submerged, there was practically no aquatic vegetation, neither standing nor floating. Here were two species of dragonflies flying and ovipositing. One was *Somatochlora franklini* Selys, the other *Aeshna sitchensis*. The latter was the commoner of the two, but was far from numerous, the bog often appearing for many minutes at a time to be devoid of dragonfly life.

The males of *A. sitchensis* flew low, as a rule, only a foot or two from the ground, sometimes apparently at random over the bog, sometimes following the stream for some distance, but not covering a definite beat. They flew less swiftly than most Aeshnas and frequently dropped to the surface of the water for an instant, in a manner somewhat suggestive of an ovipositing female.

The females were frequently observed ovipositing in the wet moss about the edges of the small puddles in the bog, many of which were less than a square foot in area. The manner of oviposition was quite like that of other Aeshnas. The insect would light on the moss and thrust the abdomen into it in various directions, following no regular plan. Usually she remained at one spot less than half a minute, then flew on a few yards and repeated the operation. Once or twice copulating pairs were seen to rise from the bog and fly to the neighbouring trees.

A prolonged search was made for nymphs and exuviae, but although *Somatochlora* exuviae and a few young nymphs were found, no trace of the early stages of *sitchensis* appeared.

I was now, however, on the right track. I had at last penetrated the mystery of this strange dragonfly's haunts, which proved to be the same as those of the equally little-known *Somatochlora franklini*. It may be recalled, however, that the correct solution of this puzzle was already hinted at by Mr. F. C. Whitehouse (Can. Ent., XLIX, 1917, p. 100), who says: "I incline strongly to the opinion that the true breeding of this northern insect is muskeg, which may account for the nymph being still unknown."

On August 5 I left Field and arrived at Banff on the same day. I told my friend, Mr. N. B. Sanson, Curator of the Rocky Mountain Park Museum, of my experience at Field, whereupon he kindly offered to conduct me to a bog which he thought might prove interesting in a similar way. This bog, which we visited on August 9, is at the foot of Mount Rundle, and proved to be very like the one at Field, but much larger and in every way more productive. It appeared to be fed by seepage from a cold mountain stream. At the lower end of the bog there were two or three small ponds around which cat-tails and other standing aquatic plants grew, but the water was very cold and no dragonflies were seen in this part. The upper and middle parts of the bog were mossy and practically without standing aquatic plants and the open areas of water were mere puddles like those at Field. The water here was also warmer. One could walk through it without sinking more than a foot or so, if careful to pick out the firmer-looking moss hummocks.

As in the case of the bog at Field, there were very few dragonflies here, but I soon observed *A. sitchensis* flying and ovipositing as before, and soon afterwards a *Somatochlora* was seen and captured. It was not, however, *franklini,* but a species which at present has no published name. *Somatochlora* exuviae were rather common and I obtained a full grown nymph, but for some time I found no trace of Aeshnas. After further search I found an exuvia, but was disappointed in recognizing it as *juncea,* a species that is abundant here about the small ponds in the marsh along the railway track, where I found many of the exuviae. At length, however, I found four small Aeshna exuviae of the penultimate stage, to judge by their wing-length, and one slightly larger exuvia of the final moult. These, which from their small size I had no doubt were *sitchensis,* were supplemented by three others on the following day. Males and females are represented by both stages.

These nymphs look like miniatures of *A. interrupta* or *eremita,* but resemble still more closely that of *A. coerulea* Ström, which was described recently by F. Ris (Mitteilungen der Schweizerischen Entomologischen Gesellschaft, Bd. XII, pp. 348-354, Taf. XIX, 1916). This was to be expected, as these two species are very nearly related and together form a distinct section of the genus Aeshna. The haunts of *coerulea* in Switzerland, as described by Ris, are also strikingly similar to those of *sitchensis,* as indicated by the following passages:—"es war an sehr mässig ansteigender Talflanke eine kleine, flache, ganz von Quellen ausgefüllte Mulde, ohne grössere Wasseransammlung, teilweise torfig, hauptsächlich aber über schieferigem Geroll mit massenhafter Vegetation von Saxifraga aizoides." (Op. cit., p. 350); and again, concerning another locality: "Sie flug nicht am See selbst, sondern auf quelligem und torfigem Gelände in seiner unmittelbaren Umgebung."

Aeshna coerulea is a circumpolar species, occurring in North America as the race *septentrionalis.* I took a single specimen of this form at Banff, in 1913, flying with *sitchensis,* and it is very probable that it breeds in the same places as the latter, though apparently very rare here.

Description of the Nymph.

Nymph small and rather slender. Head as in *juncea* and *interrupta,* broadest across the middle of the eyes, which are a shade more prominent than in *interrupta.* Lateral margins of head short, passing through well-rounded angles into the posterior margin, which is straight or feebly excavated when viewed directly from above. Mentum of labium reaching back to middle of mesocoxae, very like that of *eremita* in form, basal breadth about three-fifths of the apical, greatest breadth four-fifths of the length; the sides nearly straight and feebly divergent from base to a point just beyond the middle, distad of which they are strongly arcuate. Middle lobe prominent, narrow and obtus-angulate, resembling that of *juncea* closely. Lateral lobes broad, the terminal parts subequal, squarely truncate, outer angle scarcely rounded, inner angle with a minute tooth. Supra-coxal processes rather short and blunt, subequal in length, the posterior slightly the stouter, the interval nearly rectangular. Abdomen broadest at segments 6 and 7, a little slenderer than in *interrupta*; lateral spines present on segments 7 to 9 only, those of 7 minute rudiments, those of 8 extending half way to the base of seg. 9, those of 9 as far as the

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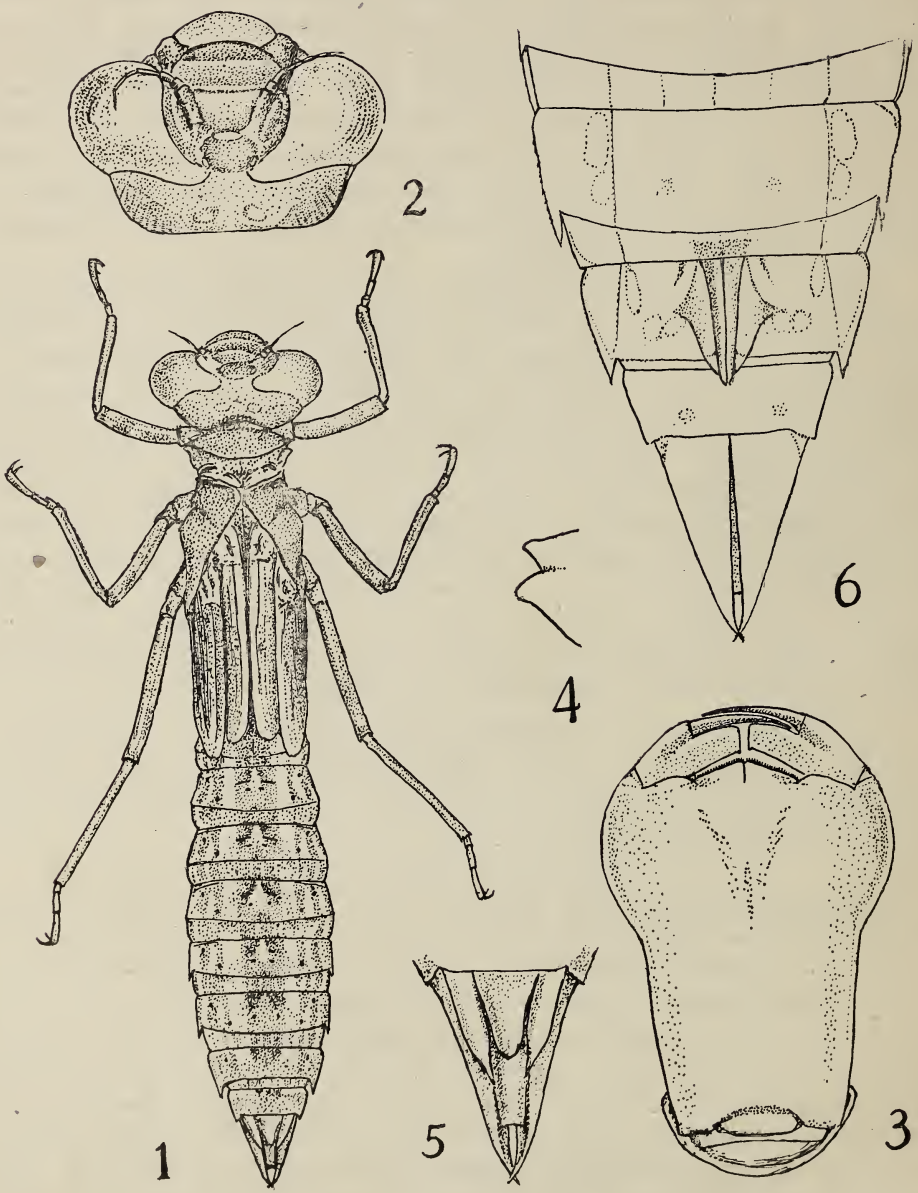
Plate VIII



THE NYMPH OF AESHNA SITCHENSIS HAGEN

(See Page 226)

proximal fourth of 10. Inferior appendages scarcely longer than segs. 9 and 10 together, their apices distinctly incurved; median superior appendage about one-fourth shorter, the basal tubercle in the male triangular, with a blunt, rounded apex, about three-fourths as long as the paired superior appendages (lateral appendages), which in the male are rather more, in the female barely less, than half as long as the inferior appendages. Ovipositor extending over about one-fourth to one-third of seg. 10, the lateral gonapophyses (genital valves) a little shorter, just about reaching to the base of that segment.

Colour Pattern. Head almost uniform brownish, thorax with traces of paler mottlings in some specimens. Legs nearly uniform, with more or less distinct traces of two or three pale femoral bands, a median, an anteapical and sometimes a basal band. Abdomen brownish with pale markings almost exactly as in *eremita* and *interrupta*. Extending practically the entire length is an ill-defined brown median band, which tends to deepen in front of the dorsal punctae, typically forming paired submedian, -shaped spots at the front margins of most of the segments. This band is bordered laterally by a pair of pale bands, which are most distinct on the anterior segments, and on the anterior part of each segment, forming in dark specimens a subcontinuous series of pale spots. Laterad of these bands is a series of subcrescentic pale spots and a broad marginal pale area, just enclosing the lateral scars, which are outlined in brown. Punctae all dark brown.

Length of body 31.5 to 32.5 mm.; mentum of labium 4.5 to 5.0 mm.; hind wing-pads 7.5 mm.; hind femora 5.5 mm.; inf. apps. 3.0 to 3.25 mm.; ovipositor 2.25 to 2.5 mm.; width of head 7 mm.; width of abdomen 6 mm.

The immature exuviae are similar to the full-grown examples, except in size and length of wing-pads and genitalia. The paired superior appendages of the males are only about three-eighths the length of the inferior pair, and the ovipositor does not quite reach to the posterior margin of seg. 9 . The colour pattern is similar but darker, and with more distinct markings than in most of the full-grown exuviae. All are of about the same size and the measurements are as follows:—

Length of body 29 mm.; mentum of labium 3.5 mm.; hind wing-pad 3.5 mm.; hind femora 4.5 mm.; inferior appendages 2.75 mm.; ovipositor 6.0 mm.; width of head 6.0 mm.; width of abdomen 5.5 mm.

As these exuviae evidently belong to the penultimate stage and as the period of emergence was long over when they were taken, it is evident that the nymph of *Aeshna sitchensis* enters the last stage during the season before that in which it emerges. This appears to be the usual habit in boreal Odonata.

As compared with Ris's description and excellent photographs of the female exuvia of *A. coerulea,* that of *sitchensis* is seen to differ very little except in the form of the labium and the somewhat shorter caudal appendages. The body of *sitchensis* is somewhat more slender, as is also true of the adults, and the head is a little wider than the thorax, whereas in *coerulea* it appears to be of about the same width. The mentum of the labium is distinctly broader in *sitchensis,* its greatest breadth being equal to fully four-fifths of its length, while in *coerulea* it is equal to about two-thirds of its length. The inferior paired appendages, besides being shorter, appear to be more strongly incurved

at the apices than in *coerulea*, though the curving is quite noticeable in the figure of *coerulea*. The lateral spines on segments 8 and 9 of the abdomen appear to be a trifle shorter in *sitchensis*.

The nymphs of these two related species are readily distinguished from all other known nymphs of North American species of *Aeshna* by the entire lack of lateral spines on the 6th abdominal segment. The nymph of *sitchensis*, like the adult, is on the whole the smallest of North American species, though *coerulea septentrionalis* is often no larger. *A. californica* is the only other species that is comparable to these two in its small size.

Explanation of Plate.

Aeshna sitchensis Hagen.

Fig. 1. Exuvia of full-grown male nymph. The head is slightly bent forward.

Fig. 2. Head of same, direct dorsal view.

Fig. 3. Labium (closed), ventral view.

Fig. 4. Left supra-coxal process.

Fig. 5. Caudal appendages of male, dorsal view.

Fig. 6. Terminal abdominal segments of female nymph, ventral view.

A REVISION OF THE NEARCTIC SPECIES OF THE TACHINID GENUS ERNESTIA R.D. (DIPTERA).

BY JOHN D. TOTHILL,

In charge of Natural Control Investigations, Entomological Branch, Ottawa.

(Continued from Page 205.)

Description of Species.

Ernestia (Meriania) flavicornis Brauer.

Head at vibrissae about as thick as at base of antennae; vibrissae well above the oral margin. Palpi yellow. Eyes hairy, cheeks (below the eyes) white pollinose on a black ground, subshining on the lower hairy part, a row of stouter hairs or bristles at the oral margin. Distance from the oral margin to base of eye equal to about one-third the eye height; sides of face covered with silvery pollen; with some weak hairs on the upper part; narrowest width equal to or slightly greater than the length of the second antennal segment. Facial ridges bristly on the lowest fourth. Facial depression silvery pollinose, without any carina. Antennae reaching the lowest fourth of the face, all three segments rufous; third segment about one and one-fourth times as long as the second. Arista thickened on basal two-fifths to three-fifths, the penultimate segment slightly longer than broad. Width of front in male equal to the length of, in the female equal to two and a half times the length of, the second antennal segment; the front silvery pollinose; frontal vitta dull, dark-brown, at narrowest point equal in male and twice in female the width of either side of front just cephalad of the ocellar triangle. Orbital bristles present in female, absent in male. Ocellar bristles absent in male, present and proclinate in female; the single row of frontal bristles descending nearly to the base of the third antennal segment.

Thorax subshining, black, covered with gray pollen; scutellum gray pollinose on a black ground that becomes faintly rufous toward the apex. Three sternopleural macrochaetae and typically four dorsocentrals, although both sets are subject to considerable variation; scutellum with four marginal pairs of macrochaetae and with an apical cruciate pair. Legs black, the middle tibiae with two or more bristles on the front side near the middle, the hind tibiae without a comb-like row of bristles on the outer side. Wings hyaline. R_{4+5} (third vein) with a group of two to five hairs both above and below at the junction with R_{2+3}. Bend of M_{1+2} destitute of an appendage. Radio-medial cross vein cloudy. Tegulae white.

Abdomen subshining; silvery pollinose on a black ground. No discal macrochaetae present on the second abdominal segment, but a pair on each of the following segments; marginals present on the second, third and fourth. The hind margin of the third tergite not arcuate even in the male. The fifth tergum in the male marked off distinctly by a suture from the fourth and about one-fifth as long as the fourth. The sixth and seventh abdominal segments forming genital segments that are noticeably smaller than in *E. ampelus* Walker and the other species described in this paper.

Genital segments of the male black. The basal part of the outer forceps not covered by a leaf-like expansion. The basal part of the inner forceps without a median keel-like projection; the distal part forming a straight, bayonet-shaped blade.

The indenture in the last sternite of the male extends to the base of the sternite so that the sternite is split longitudinally into two halves.

Redescribed from six males and four females in the U.S.N.M. collection and in the Canadian National collection. Collected from the White Mountains, Franconia, N.H.; Mandan, N.D.; Cranbrook, B.C.; and Lillooet, B.C.

Ernestia (Meriania) nigrocornea sp. n.

Description of Male. Head at vibrissae about as thick as at base of antennae, vibrissae far above the oral margin. Palpi reddish. Eyes hairy. Cheeks (below the eyes) white pollinose on a black ground with black hairs on the subshining part, coming nearly up to the eyes and with a row of stouter hairs at the oral margin. Distance from the oral margin to base of eye equal to about one-half the eye height. Sides of face silvery pollinose; bare, except for a few sparse hairs, particularly at the upper part; narrowest width equal to about twice the length of the second antennal segment. Facial ridges bristly on lowest third. Facial depression silvery pollinose without any carina. Antennae reaching lowest three-fourths of the face, all three segments black or very dark-brown in color; third segment about twice as long as the second. Arista thickened on basal half; the penultimate segment scarcely longer than broad; width of front at narrowest point measuring about twice the length of the second antennal segment; silvery pollinose; frontal vitta dull, dark-reddish brown, at narrowest point measuring almost half the width of front at vertex. No orbital bristles; the frontal bristles extending nearly to the base of the third antennal segment. Ocellar bristles well-developed and proclinate..

Thorax subshining, black, covered with gray pollen; scutellum gray

pollinose on a black ground, tinged reddish at the apex. Three sternopleural bristles and four pairs of dorsocentrals; scutellum with four pairs of marginal bristles and an apical pair that may, or may not, be cruciate. (These are broken off in the type specimen). Legs black, the middle tibiae with two or more bristles on the front side near the middle, the hind tibiae without a comb-like row of bristles on the outer side. Wings hyaline; R_{4+5} (third vein) with a group of two to five hairs at the base on both the upper and lower surface. M_{1+2} with a distinct appendage at the bend. Tegulae white.

Abdomen subshining; silvery pollinose on a black ground, the lateral parts of the first three segments somewhat rufous. Discal bristles absent on segments one, two and three, a pair of median marginal macrochaetae on segments two, three and four. The fifth tergum distinctly marked off from the sixth; the greatest width of the fifth equal to about one-fifth the narrowest width of the fourth segment. The sixth abdominal segment about three-fourths the length of the fourth and forming a conspicuous genital segment.

The black-colored genitalia are characterized by the absence of a keel-like projection at the base of the inner forceps, by the extraordinary length of the apical blade-like portion of the inner forceps and by the unusual degree of lateral compression of each of the apical portions of the outer forceps. The broad, leaf-like expansion covering the base of the outer forceps in so many of the *Ernestia* species is lacking in this species.

The indenture of the fifth sternite extends nearly to its base.

Described from a single male taken by Mr. E. C. Van Dyke at Lake Tahoe, California, on September 15th.

Type in the Canadian National Collection at Ottawa.

Ernestia frontalis sp. n.

Description of Male. Head at vibrissae about as thick as at base of antennae; vibrissae close to the oral margin. Palpi yellowish at tip, infuscate below. Eyes hairy. Cheeks (below the eyes) white pollinose on a black ground, subshining on the lower hairy part, a row of stouter hairs or bristles at the oral margin. Distance from the oral margin to base of eye equal to about one-third the eye height. Sides of face covered with silvery pollen; bare; narrowest width slightly less than the length of the second antennal segment. Facial ridges bristly on lowest fourth. Facial depression silvery pollinose, without any carina. Antennae reaching the lowest fourth of the face, all three segments black; third segment about one and one-fourth times as long as the second. Arista thickened on basal half, the penultimate segment slightly longer than broad. Width of front at narrowest point measuring about three-fourths the width of an eye and about twice the length of the second antennal segment; the front silvery pollinose; frontal vitta dull, dark-brown, at narrowest point fully twice as wide as either side of front just cephalad of the ocellar triangle. No orbital bristles, the proclinate ocellars somewhat weak; the single row of frontal bristles descending to the base of the third antennal segment.

Thorax subshining, black, covered with gray pollen, scutellum gray pollinose on a black ground that becomes rufous toward the apex. Three sternopleural bristles and typically four dorsocentrals; scutellum with three

marginal pairs of macrochaetae and an apical cruciate pair. Legs black, the middle tibiae with two or more bristles on the front side near the middle, the hind tibiae without a comb-like row of bristles on the outer side. Wings hyaline. R_{4+5} (third vein) with a group of two to five hairs both above and below at the junction with R_{2+3}. Bend of M_{1+2} with an appendage. An unusually long costal spine. Tegulae white.

Abdomen subshining; silvery pollinose on a black ground. Discal and marginal macrochaetae present on the second, third and fourth abdominal segment. The hind margin of the third abdominal segment not arcuate. The fifth tergum marked off distinctly from the shining sixth, and at the lateral part being about one-fifth the length of the lateral part of the fourth. The sixth and seventh abdominal segments forming the not very prominent genital segments.

Genitalia black. The basal part of the outer forceps without a leaf-like expansion. The basal part of the inner forceps without a median keel-like portion.

The horseshoe-like indenture extends almost to the base of the last sternite.

Described from two males from Yukon River, Alaska, and Cranbrook, B.C., taken by Messrs. Harrington and C. Garrett.

Type Number 24,352 in the U.S.N.M., Washington, D.C., the paratype in the Canadian National Collection, Ottawa.

Ernestia johnsoni sp. n.

Description of Male. Head at vibrissae about as thick as at base of antennae; vibrissae far above the oral margin. Palpi yellow in the type material. Eyes hairy. Cheeks (below the eyes) white pollinose on a black ground with black hairs coming nearly up to the eyes and with a row of stouter hairs at the oral margin. Distance from the oral margin to base of the eye equal to about one-third the eye height. Sides of face silvery pollinose; bare; narrowest width of the front slightly greater than the length of the second antennal segment. Facial ridges bristly on lowest fourth. Facial depression silvery pollinose without any carina. Antennae reaching the lowest fourth of face, all three segments black; third segment about one and one-half times as long as the second. Arista thickened on basal two-fifths, the penultimate segment scarcely longer than broad. Width of front at narrowest point measuring a little more than the length of the second antennal segment; the front silvery pollinose; frontal vitta dull, dark-brown; at narrowest point about twice as wide as either side of the front immediately cephalad of the ocellar triangle. No orbital bristles, the proclinate ocellars somewhat weak; the single row of frontal bristles descending nearly to the base of the third antennal segment.

Thorax subshining, black, covered with gray pollen; scutellum gray pollinose on a black ground, in most specimens tinged reddish, especially at the apex. Typically three sternopleural bristles, but they are variable; typically four dorsocentral macrochaetae, some specimens with only three; scutellum with three marginal pairs of macrochaetae and with an apical cruciate pair. Legs black, the middle tibiae with two or more bristles on the front side near the middle, the hind tibiae without a comb-like row of bristles on the outer

side; wings hyaline; R_{4+5} (third vein) with a group of two to five hairs both above and below at the junction with R_{2+3}. Tegulae white.

Abdomen subshining; silvery pollinose on a black ground. Discal macrochaetae present on the second, third and fourth abdominal segments; median marginals present on the same segments. The hind margin of the third tergum strongly arcuate. The fifth tergum pollinose and marked off from the shining sixth tergum by a somewhat faint suture. The greatest length of this segment is about one-fifth the lateral length of the fourth tergite. The sixth and seventh abdominal segments forming somewhat distended genital segments. Genitalia black. The basal part of the outer forceps is expanded into a broad, leaf-like portion. The basal part of the inner forceps is equipped with a short, median, keel-like projection, the two edges of which are almost straight in profile.

The horseshoe-like indenture extends very slightly more than halfway to the base of the fifth sternite.

Described from four males from Wellesley, Mass., (type locality) Melrose Highlands, Mass.; North Saugus, Mass., and Fry Creek, B.C.

One specimen bred from *Hyphantria cunea* Drury. This species should not be confused, however, with *E. ampelus* Walk., which is a major parasite of *Hyphantria*.

Type number 24,353 in the U.S.N.M., Washington, D.C. A paratype from Fry Creek, B.C., in the Canadian National Collection, Ottawa.

This species is named in honor of Mr. C. W. Johnson, whose name is inseparably associated with the Dipterology of the Atlantic seaboard.

(To be Continued.)

ON SOME CHILOPODS AND DIPLOPODS FROM KNOX CO., TENNESSEE.

BY RALPH V. CHAMBERLIN,
Cambridge, Mass.

The chilopods and diplopods here listed compose a collection made in Knox Co., Tenn., during Jan. and Feb., 1921, by Mr. Geo. G. Ainslie, by whom they were transmitted to the writer for study.

Chilopoda.

1. *Cryptops hyalinus* (Say).

One specimen of this widespread southern form.

2. *Otocryptops sexspinosus* (Say).

One specimen.

3. *Linotaenia fulva* (Sager).

One specimen.

4. *Sonibius rex* (Bollman)

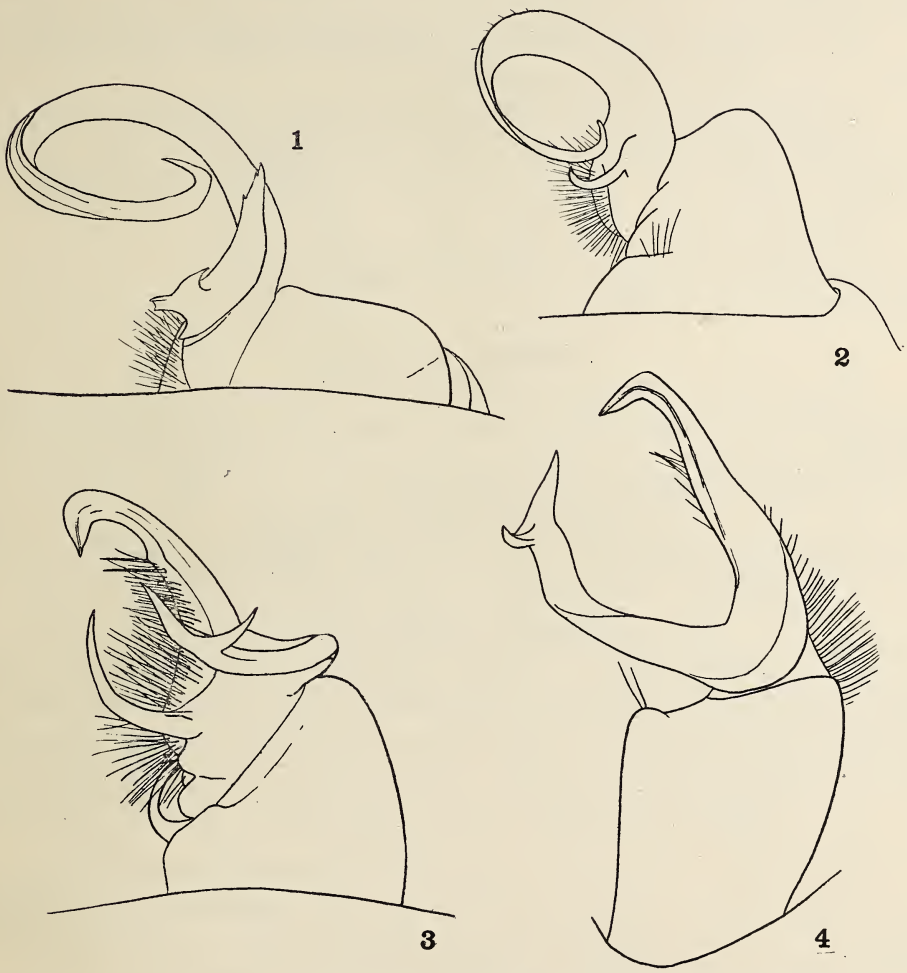
Lithobius rex Bollman, Proc. U. S. Nat. Mus., 1888, 11, p. 350.

One male of this species was taken at Elkmont, elevation 3,500 feet, on Feb. 15. It was previously known only from the type, which is a female.

Diplopoda.

5. *Platydesmus lecontei* (Wood).

One specimen.



CHILOPODS AND DIPLOPODS FROM TENNESSEE.

1. *Apheloria ainsliei*, sp. n., right gonopod, anterior view.
2. *Apheloria montana* (Bollman) right gonopod, anterior view.
3. *Pachydesmus retrosus* sp. n., right gonopod, anterior view.
4. The same, ectal view. All x 16.

6. *Callipus lactarius* (Say).

One specimen of this common and widespread form.

7. *Euryurus erythropygus* (Brandt).

A number of specimens, mostly not in full color.

8. **Pachydesmus retrorsus,** new species.

Above, light brown or fulvous to fuscous when in full color, with keels a lighter brown.

No processes from sternite between third or fourth legs or from any others. First joint of legs also unarmed.

The gonopods are of the same general type as in *crassicutis* (Wood), but are at once differentiated in having the spur toward distal end of outer (anterior) branch of telopodite much longer and retrorse, as well as in other details. See Pl. ix, figs 3 and 4.

Length, about 65 mm.; width, 12.75 mm.

Locality—Tennessee, Knox Co., Geo. G. Ainslie, collector.

Type—M. C. Z., No. 5028.

Apheloria, new genus.

Erected for a group of species, heretofore included in *Fontaria,* in which the telopodite of the gonopod of male is a simple, coiled blade with a small spur at base.

Genotype—*Fontaria montana* Bollman.

9. *Apheloria montana* (Bollman).

Fontaria montana Bollman, Proc. U. S. Nat Mus., 1887, 10, p. 622.

Six specimens. The gonopod as shown in Pl. ix, fig. 2.

10. **Apheloria ainsliei,** new species.

The dorsum is black or nearly so but with a broad band across caudal border and forward over keels of each segment fulvous brown to light olive, the latter being more typical; the median part of cross band sometimes obscure, but the keels always of the lighter color. Antennae dark brown. Legs fulvous.

Second joints of legs with the usual long spine ; the first joints with a low conical eminence but this not at all spiniform.

This species is characterized by having the telopodite of gonopod bent into a complete circle, or a little more, and by the form of the basal spur which presents a main branch appressed to base of telopodite with apex distad and a flat. dentate branch extended mesad as shown in Pl. ix, fig. 1.

Length, about 45 mm.; width, 13 mm.

Locality,—Tennessee: Knox Co. Geo. G. Ainslie, coll. Several specimens.

Type,—M.C.Z., No. 5,027.

11. *Polydesmus branneri* Bollman.

Two males taken at Knoxville in Jan., and two females taken Feb. 15.

12. *Scytonotus granulatus* (Say).

A male and two females.

13. *Parajulus impressus* (Say).

Many immature females taken 24 Feb.

14. *Parajulus pennsylvanicus* (Brandt).

Two males taken in Jan.

15. **Parajulus annectans,** new species.

Closely related to *P. nigrans* Chamberlin, described from near Nashville, which it much resembles in its small size, though more slender, and in its dark coloration. The dorsum above the repugnatorial pores, however, is lighter, having a reddish tinge, and is marked with a median longitudinal dark line.

In the original description of *nigrans* the anal tergite is said not to exceed the valves, but reexamination shows this to be due to the fact that the valves are not fully closed. In the present species the anal tergite is acutely produced well beyond the valves, the mucro straight.

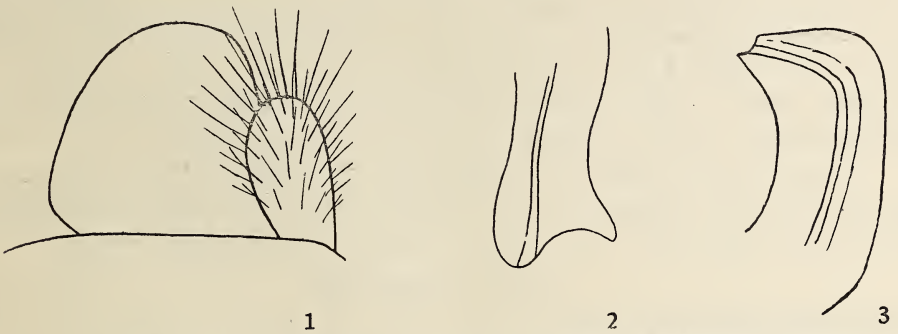


Fig. 1.—1. *Parajulus annectans* sp. n. Anterior gonopod of left side, ectal view, x72. 2. Tip of telopodite of right posterior gonopod, ectal view, x115. 3. *Parajulus nigrans* Chamb. Tip of telopodite of left posterior gonopod, ectal view, x115.

The two species are clearly distinct in the structure of the gonopods of male, although in this closer to each other than to any other known species. In *annectans* the posterior division of the anterior gonopods is broader and shorter relatively to the anterior division, distally broadly rounded, not distally narrowed and bent in mesad. The principal blade of the posterior gonopod is covered in lateral view by the anterior gonopod, whereas in *nigrans* it descends well below the level of the anterior member; distal end in *annectans* with distoventral corner angled and extended ventrad as shown in fig. 1, 2 instead of being rounded as it is in *nigrans*. (See fig. 1, 3). Anterior gonopod as shown in fig. 1, 1. Spine from base of posterior gonopod long and acute, extending ventrad.

Number of segments, forty-eight.

Locality,—Tennessee: Knox Co. One male.

Type,—M.C.Z., No. 5,024.

16. *Spirobolus marginatus* (Say).

Two large specimens taken at Elkmont, el. 3,500 ft., and one at Knoxville.

NEW ENGLAND HEMIPTERA-HETEROPTERA.

New Records. II.[1]

BY H. M. PARSHLEY,

Smith College, Northampton, Mass.

During the four years which have elapsed since the publication of my New England List of Hemiptera-Heteroptera[2] I have made an effort to keep track of all additions to this fauna which have come to light. In 1919 I published

[1] Contributions from the Department of Zoology, Smith College, No. 82.

[2] Occas. Papers of the Boston Society of Natural History. VII. Fauna of New England. 14. List of the Hemiptera-Heteroptera, August, 1917.

a formal supplement,[3] and later some other papers[4] with new data, while several works (cited hereinafter) have appeared, in which new species from our region are described. The examination of various collections has also afforded additional information on our fauna. All the new data thus gathered since the first supplement are collected here, bringing the New England enumeration down to date.

In the original list 419 species were recorded, one of which has since been removed as a synonym.[5] In the first supplement 15 species[6] were added, and in the present paper 39 more, which brings the total number of Heteroptera now known to inhabit New England to 472. It is worthy of note that of these newly recorded members of our fauna 31 are species described since the publication of the original List in August, 1917, especially in revisions of *Aradus* and *Phytocoris*, genera which previously had been little studied, and that the other additions number only 22, or about 5% of the first enumeration.

In the following pages the species given in bold-face type are recorded as additions to the New England fauna, while the others are in almost all cases new to the various State lists. For collectors' names see the original paper.

PENTATOMIDAE

Sciocoris microphthalmus Flor.

ME.—Cumberland County, 1916 (*A. Nicolay*).

Peribalus limbolarius Stal.

ME.—Peaks Island, 3 Aug. '18 (*G. A. Moore*).

Euschistus politus Uhler.

CONN.—Portland, 20 July '19 (*B.H.W.*).

Mineus strigipes (Herrich-Schaeffer).

CONN.—New Canaan, 12 Sept. '18 (*M.P.Z.*).

ARADIDAE.

ARADINAE

Aradus robustus Uhler.

N.H.—Three Mile Island, 27 May, '08 (*F.B.*)

Aradus duzeei Bergroth.

MASS.—Northampton, 17 May '19 (*Dorothy Merchant*).

Aradus proboscideus Walker. (=*A. hubbardi* Heid. of the List.)

N.H.—Mt. Washington, Summit (*A.T.S.*).

Aradus basalis Parshley.

Trans. Am. Ent. Soc., XLVII:54, 1921.

ME.—Holden, 20 June '02 (*F.A.E.*); Mt. Katahdin, 9 Aug. '02 (*H.G.B.*).

N.H.—Mt. Washington, Summit (*A.T.S.*): Temple, 26 May '00 (*F.B.*)

Aradus consors Parshley.

Op. cit., p. 56.

MASS.—(*S.H.*).

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[3] N.E. Hem.-Het. New Records, Can. Ent., LI:70-72, 1919.

[4] Hem. Peaks Island, Maine, Can. Ent., LII:80-87, 1920.
Hem. Western N.E., Psyche, XXVII:139-143, 1920.

[5] *Melanorhopala obscura* Parsh.=*M. clavata* Stal.

[6] *Corythucha pallipes* Parsh, now includes *C. cyrta* Parsh. and *C. betulae* Drake.

Aradus similis Say.

N.H.—Durham, 19 Apr. '06 (*C. S. Spooner*).

Aradus shermani Heidemann.

ME.—Orono, 22 May '14 (*H.M.P.*).

Aradus inornatus Uhler.

ME.—Orono, 1 May '14 (*H.M.P.*).

N.H.—Claremont, June-Oct.; Hanover (*C.M.W.*); Merrimack, 11 May '00 (*F.B.*).

MASS.

Aradus approximatus Parshley.

Op. cit., p 72.

ME.—Mt. Katahdin, 26 Aug. '02 (*H.G.B.*).

Aradus borealis Heidemann.

ME.—Mt. Katahdin, 5215 ft., 19 Aug. '02 (*H.G.B.*).

Aradus insignitus Parshley.

Op. cit., p. 75.

MASS.—(*F. G.Sanborn*).

Aradus abbas Bergroth.

N.H.—Mt. Washington ; Three Mile Island, 23 May '08 (*F.B.*)

Aradus falleni Stal.

R.I.—Providence (*C.A.D.*).

CONN.—New Haven, 18 June '19 (*M.P.Z.*).

Aradus cinnamomeus Panzer.

MASS.

Aradus niger Stal.

ME.—S. W. Harbor, 11 July '18 (*C.W.J.*).

MASS.—Northampton, 8 Oct. '19 (*Ottilie Meiner*); Pelham, 28 Aug. '19 (*H.M.P.*).

MEZIRINAE.

Neuroctenus simplex Uhler.

CONN.—Branford, 6 April '21 (*M.P.Z.*).

NEIDIDAE.

Neides muticus (Say).

VT.—Haystack Mt., 5 Sept. '19 (*H.M.P.*).

LYGAEIDAE.

Geocoris uliginosus (Say).

CONN.—New Haven, 11 July '20 (*B.H.W.*).

Perigenes constrictus (Say).

CONN.—Salem, 12 July '14 (*H.W.F.*).

Zeridoneus costalis (Van Duzee).

Barber has recently proposed[7] the new genus *Zeridoneus* for *Perigenes costalis* (List, page 49). The Boston record pertains to *P. constrictus*.

7 Concerning Lygaeidae, No. 1, Jour. New York Ent. Soc., XXVII:45, 1918. Synop, Keys Lyg. II., Psyche, XXV:76, 1918.

Ptochiomera clavigera Uhler.

MASS.—Dracut.

CONN.

Pseudocnemodus canadensis (Provancher).

CONN.—Salem, 22 July '14 (*H.W.F.*).

Kolenetrus plenus (Distant).

ME.—Peaks Island, 26 July '18 (*G. A. Moore*).

Stygnocoris rusticus (Fallén).

ME.—Peaks Island, 31 July '18, 8 Aug. '19 (*G. A. Moore*).

Emblethis vicarius Horváth.

MASS.—Northampton, 7 Oct. '20 (*H.M.P.*)

Microtoma atrata (Goeze).

Barber, Concerning Lyg., No. 2, Jour. New York Ent. Soc., XXVI:61,'18.

R.I.—(Uhler collection; locality possibly incorrect).

TINGIDAE.

Stephanitis pyrioides (Scott).

CONN.—New Canaan, 20 Sept. '19 (*P. Garman*).

Corythucha pyriformis Parshley.

Can. Ent., LII:81, 1920.

ME.—Peaks Island, 31 July '19 (*G. A. Moore*).

N.H.—Franconia (*A.T.S.*).

Corythucha heidemanni Drake.

VT.—Woodford, 5 Sept. '19 (*H.M.P.*)

Corythucha ulmi Osborn and Drake.

N.H.—Durham (*C.M.W. and W.F.F.*),

Corythucha mollicula Osborn and Drake. (=*C. salicis* O.&D., List, p. 119.)

Drake, Notes Am. Ting., Florida Ent., March, 1921, p. 53.

ME.—Orono, 16 July '06.

Leptoypha mutica (Say).

MASS.—Lexington, 25 June '20 (*G. W. Barber*).

Physatocheila brevirostris Osborn and Drake.

CONN.—New Haven, 5 July '20 (*B.H.W.*).

Alveotingis grossocerata Osborn and Drake.

CONN.—New Haven, 5 July '20 (*B.H.W.*)

NABIDAE.

Nabis sordidus Reuter.

CONN.—Guilford, 13 July '20 (*B.H.W.*)

Nabis roseipennis Reuter.

VT.—Haystack Mt., Sept. '19 (*H.M.P.*).

Metatropiphorus belfragii Reuter.

CONN.—Pleasant Valley, Litchfield Co., 1 Aug. '15 (*G.P.E.*)

ANTHOCORIDAE.

Tetraphleps americana Parshley.

Can. Ent., LII:84, 1920.

Me.—Peaks Island, 3 Aug. '19 (*C. A. Moore*).

Tetraphleps uniformis Parshley.

Op. cit., p. 85.

N.H.—Mt. Washington (*A.T.S.*).

MIRIDAE

Phytocoris pallidicornis Reuter.[8]

VT.—Haystack Mt., 5 Sept. '19 (*H.M.P.*).

Phytocoris eximius Reuter.

Knight, Bull. Brooklyn Ent. Soc., XV:51, 1920.

ME.—Casco Bay, 27 Sept. (*G.P.E.*).

MASS.—Northampton, 27 Sept. '18 (*H.M.P.*).

Phytocoris neglectus Knight.

Op. cit., p. 54.

ME.—N.E. Harbor, 26 July (*C.W.J.*).

MASS.—Boston, 13 Oct. '15 (*H.M.P.*), and nearby stations; Woods Hole, 15 July-6 Aug. (*C.E.O.*).

Phytocoris onustus Van Duzee.

Proc. Calif. Ac. Sci., (4) IX:344, 1920.

Knight, *Op. cit.*, p. 54.

ME.—Machias, 22 July '09 (*C.W.J.*); Mt. Katahdin, 650 ft., 22 Aug. '13 (*C.P.A.*).

N.H.—Glen House, 24 July '15 (*C.W.J.*)

VT.—Haystack Mt., 5 Sept. '19 (*H.M.P.*) (Det. ? by Knight).

Phytocoris spicatus Knight.

Op. cit., p. 55.

ME.—Machias, 19 July '09 (*C.W.J.*).

MASS.—Lunenburg, 15 July '16 (*H. W. Allen*).

Phytocoris cortitectus Knight.

Op. cit., p. 55.

N.H.—Glen House, 24 July '15 (*C.W.J.*).

Phytocoris salicis Knight.

ME.—Machias, 26 July '15 (*C.W.J.*).

N.H.—Hanover, 3 July '15 (*C.W.J.*).

MASS.—Beach Bluff, 11 Aug. '15 (*H.M.P.*); Lunenburg, 22 July '16 (*H. W. Allen*); Sunderland, Mt. Toby, 6 July '18 (*H.M.P.*); Woods Hole, 6 Aug. (*C.E.O.*).

CONN.—Branford, 15 July (*H.W.W.*).

Phytocoris buenoi Knight.

Op. cit., p. 57.

MASS.—Marblehead, 24 July '14 (*H.M.P.*); Woods Hole, 6 Aug. (*C.E.O.*).

CONN.—New Haven, 27 June (*W.E.B.*)

Phytocoris erectus Van Duzee.

Proc. Calif. Ac. Sci., (4) IX:345, 1920.

Knight, *Op. cit.*, p. 57.

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[8] This species and *P. onustus* Van Duzee, ♀, (?) are incorrectly recorded as *P. lasiomerus* and *P. eximius* on page 142 of the second paper cited on p. 234, foot note 4, through a clerical oversight.

ME.—Ft. Kent, 19 Aug., '10 (*C.W.J.*); Penobscot Co., 1 Aug., '10 (*J.A.C.*)
N.H.—Crawfords, 28 Sept. '16 (*H.M.P.*).
MASS.—Brookline, 25 Sept. (*C.W.J.*); Chester, 3 Aug.. '12 (*C.W.J.*); Plymouth, 28 July (*C.W.J.*).

Phytocoris penipecten Knight.

Op. cit., p. 58 (*P. penipectus, laps. cal.*)
MASS.—Amherst.
CONN.—East River (*C.R.E.*); New Britain, Sept. (*W.E.B.*).

Phytocoris fulvus Knight.

Op. cit., p. 59.
ME.—Peaks Island, 31 July '18 (*G. A. Moore*).

Phytocoris conspersipes subsp. **diversus** Knight.

Op. cit., p. 60.
ME.—Liberty, 16 Sept. '13 (*J.A.C.*).
N.H.—Franconia (*A.T.S.*).
MASS.—Northampton, 1 Oct. '20 (*H.M.P.*).

Phytocoris quercicola Knight.

Op. cit., p. 60.
MASS.—Beach Bluff, 27 Aug. '14 (*H.M.P.*).

Phytocoris conspurcatus Knight.

Op. cit., p. 61.
MASS.—Beach Bluff, 24 Aug. '16 (*H.M.P.*), at light; Boston, 9 Aug. (*H.M.P.*)
CONN.—Hartford, 12 Sept. (*W.E.B.*); Wallingford, 3 Aug. '12 (*D.J.C.*).

Phytocoris corticevivens Knight.

Op. cit., p. 63.
ME.—Orono, July '12.
CONN.—Lyme, 4 July (*H.B.K.*); New Haven, 20 June '11 (*A.B.C.*)

Phytocoris sulcatus Knight.

Op. cit., p. 64.
MASS.—Boston, 20 July (*H.M.P.*).
CONN.—Branford, 22 Aug. (*H.W.W.*).

Phytocoris tibialis Reuter.

ME.—Peaks Island, 3 Aug. '19 (*C. A. Moore*).

Paracalocoris hawleyi var. *ancora* Knight and var. *pallidulus* McAtee.

Ann. Ent. Soc. Amer., IX:378, 1916.
MASS.—Sunderland, Mt. Toby, 6 July '18(*H.M.P.*)

Lygus apicalis Fieber.

MASS.—Edgartown, 22 Aug. '12 (*C.W.J.*); Provincetown, 8 Sept. '90.

Camptobrochis borealis Van Duzee.

Proc. Calif. Ac. Sci. (4) IX:354, 1920.
ME.—Portland, 4 July '09 (*E.P.V.D.*).

Alepidia gracilis (Uhler).

MASS.—Arlington, 30 July '20 (*G. W. Barber*).

Orthocephalus mutabilis (Fallén).

ME.—Southwest Harbor, 14 July '18 (*C.W.J.*).

Macrotylus sexguttatus (Provancher).

MASS.—Lexington, 25 June '20 (*G. W. Barber*).

GERRIDAE.

Gerris marginatus Say.

VT.—Woodford, 5 Sept. '19 (*H.M.P.*).

Rheumatobates rileyi Bergroth.

MASS.—Northampton, 22 Aug. '19 (*H.M.P.*).

VT.—Woodford, 5 Sept. '19 (*H.M.P.*).

VELIIDAE.

Microvelia buenoi Drake.

Bull. Brooklyn Ent. Soc., XV:20, 1920.

ME.—Orono, 3 May '14 (*H.M.P.*).

MASS.—Northampton, 22 April '21 (*H.M.P.*); Saugus, 27 August '17 (*H.M.P.*).

This minute species, recently described from the Adirondacks, has just been found in large numbers in a small campus pond, where no Microvelia has previously occurred. Nymphal and adult stages were present. It may be readily distinguished from the equally small *M. borealis* Torre-Bueno by its shorter and thicker third antennal segment, which is clavate, not linear, the straight posterior tibiae in the male, and the conspicuous tufts of long silvery pubescence which ornament the abdomen in the apterous form. The Maine record in the List, page 108, pertains to *M. buenoi,* not to *M. borealis,* according to material now in my collection.

Microvelia hinei Drake.

Ohio Jour. Sci. XX:207, 1920.

MASS.—Northampton, 22 June '21, 3 Oct. '21 (*H.M.P.*).

In antennal structure this species resembles the preceding, but it is still smaller, shows little sexual dimorphism, and in the apterous condition is very brightly colored, though without dorsal silvery pubescence on the abdomen.

Microvelia albonotata Champion.

MASS.—Northampton 22 June '21 (*H.M.P.*).

HEBRIDAE.

Hebrus burmeisteri Lethierry & Severin.

MASS.—Northampton, 22 June '21 (*H.M.P.*).

I am not certain of the proper application of the names, *H. burmeisteri* and *H. concinnus* Uhl., and they may be synonymous as the published distribution would seem to indicate; or it is possible that *concinnus* is in reality a West Indian species, distinct from the one common in the eastern United States. At any rate I have found but one form in the latter region.

Merragata foveata Drake.

Ohio Jour. Sci., XVII:103, 1917.

MASS.—Sunderland, Mt. Toby, 28 May '21 (*Priscilla Butler*).

BELOSTOMATIDAE.

Lethocerus americanus (Leidy).

MASS.—Northampton, 7 Oct. '19 (*H.M.P.*).

Covered with a bright green alga, which changed to gray in drying.

Lethocerus obscurus (Dufour).

MASS.—Northampton, 26 Sept. '19 (*H.M.P.*).

OBITUARY.

F. W. L. Sladen.

Canadian Entomologists were shocked to learn of the accidental death by drowning of Mr. F. W. L. Sladen, Dominion Apiarist, which occurred off Duck Island in Lake Ontario on September 10th, 1921.

For several years he had been conducting important experiments in the rearing of bees. On August last he left Ottawa for the above island, which is about 20 miles distant from Kingston, Ont. He had been in the habit of bathing in the shallow water close to the shore; unfortunately he could not swim. On the above date he went in bathing as usual and it is assumed that his heart, which had troubled him for several years, failed to function, thus causing his death. The body, which was recovered about seventy feet from the shore, was partially floating, unswollen, and no water was found in the lungs.

In the death of Mr. Sladen, entomology in Canada loses a very careful worker. Other than the reputation he had gained as a successful apiarist and student of bee rearing, he was well known in Canada, as also in the United States and England, as a close, systematic student of the aculeate hymenoptera. He had a wide knowledge of the wild bees. and his writings indicate a careful taxonomic acquaintance with the various characters of the groups he studied.

The collections he brought together not only indicate keen powers of observation, but also the intense pleasure he derived in gathering series of interesting species collected while afield in various parts of Canada, particularly in the West.

The late Mr. Sladen came to Canada in 1912 to join the staff of the old Division of Entomology, as Assistant Entomologist for Apiculture. When the Division of Entomology was separated from the Experimental Farms Branch in 1914 and raised to the status of a Branch of the Department of Agriculture, Mr. Sladen was retained by the Experimental Farms Branch as Apiarist. More recently his title was changed to Dominion Apiarist. Since 1914, however, he has always had a close connection with the Entomological Branch, having been, in fact, largely responsible for the identification and arrangement of the aculeate hymenoptera in the National Collection of Insects.

He was a Fellow of the Entomological Society of London, member of the Entomological Society of America, Entomological Society of Ontario, Ottawa Field-Naturalists' Club, etc.

As an author he was best known as the writer of "Queen Rearing in England" and "The Humble Bee," both excellent treatises. He was a frequent contributor of the Canadian Entomologist, Canadian Field Naturalist and other scientific journals. One of his most recent papers was the report he prepared on the Wasps and Bees collected by members of the Canadian Arctic Expedition of 1913-1918.

Arthur Gibson.

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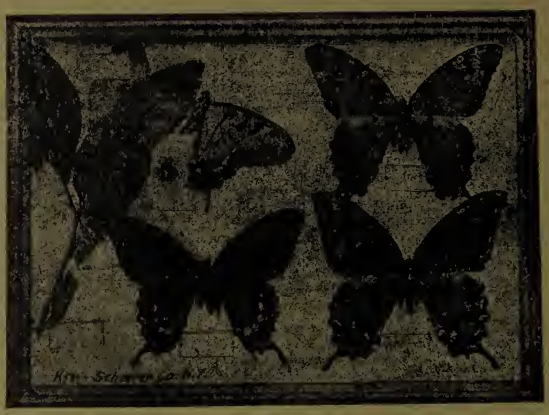

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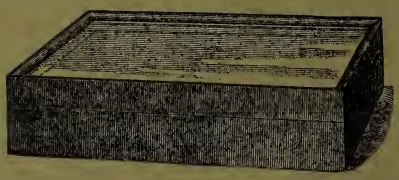

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